

What is claimed is:

1           1.       A structure comprising a carrier foil; an electrically conductive layer on one  
2 of the major surfaces of the carrier foil; a dielectric layer located on the electrically  
3 conductive layer wherein the dielectric layer having circuitry features; and metal conductive  
4 circuitry located within the circuitry features wherein the metal conductive circuitry is  
5 substantially flush/coplanar with and surrounded by the dielectric layer.

1           2.       The structure of claim 1 wherein the circuitry features in the dielectric layer  
2 are formed completely thru it to the conductive layer.

1           3.       The structure of claim 1 wherein the circuitry features in the dielectric layer  
2 are formed short of the conductive layer.

1           4.       The structure of claim 1 wherein the conductive circuitry comprised lines of  
2 about 0.5 to about 1 mil wide and being about 0.5 to about 3 mils spaced apart.

1           5.       The structure of claim 1 wherein the metal conductive circuitry comprise  
2 copper.

1           6.       The structure of claim 1 wherein the dielectric layer comprises an epoxy  
2 resin or polyimide resin.

1           7.       The structure of claim 1 wherein the carrier foil comprises copper.

1           8.       The structure of claim 1 wherein the electrically conductive layer comprises  
2 chromium.

1           9.       The structure of claim 1 wherein the flush metal conductive circuitry is  
2 covered with gold or nickel-gold.

1           10.    The structure of claim 1 wherein the flush metal conductive circuitry is  
2 selectively covered with gold or nickel-gold.

1           11.    The structure of claim 10 wherein gold wire bond attach exist between gold  
2 covered circuitry and other components or circuitry features attached to the structure.

1           12.    The structure of claim 1 wherein a cavity exist thru the dielectric layer to the  
2 electrically conductive layer wherein said cavity resides an electronic component.

1           13.    The structure of claim 1 wherein the structure is attached to a stiffening  
2 dielectric layer.

1           14.    A structure comprising repetitive layers of a structure of claim 1 attached  
2 together by a dielectric layer.

1           15.    The structure of claim 14 comprising interconnects from any layer of a  
2 conductive metal circuitry to any other layer of conductive metal circuitry.

1           16.    The structure of claim 1 comprising flush metal conductive circuitry  
2 interconnects from any via in the structure to any other via in the structure.

1           17.    A structure comprising a dielectric base layer; a second dielectric layer  
2 containing circuitry features located upon the base dielectric layer; and metal conductive  
3 circuitry located within the circuitry features wherein the metal conductive circuitry is  
4 substantially flush/coplanar with and surrounded by the second dielectric layer.

1           18.    A structure comprising repetitive layers of the structure of claim 17 wherein  
2 the conductive circuitry comprises lines of about 0.5 to about 1 mil wide and being about 0.5



1           27.    The structure of claim 26 comprising interconnects from any layer of  
2   conductive metal circuitry to any other layer of conductive metal circuitry.

1           28.    The structure of claim 26 comprising flush metal conductive circuitry  
2   interconnects from any via in the structure to any other via in the structure.

1           29.    A structure comprising a dielectric base layer; a second dielectric layer  
2   containing circuitry features located upon the base dielectric layer; and metal conductive  
3   circuitry located within the circuitry features wherein the metal conductive circuitry is  
4   substantially flush/coplanar with and surrounded by the second dielectric layer;  
5                wherein the conductive circuitry comprises lines of about 0.5 to about 1 mil wide  
6   and being about 0.5 to about 3 mils spaced apart and circuit features of sufficient size to  
7   permit an electronic component to be located in said structure.

1           30.    The structure of claim 29 wherein said electronic component is an integrated  
2   circuit chip and wherein a cavity exists thru the dielectric layer to the metal conductive layer  
3   and wherein said integrated circuit chip resides in said cavity.

1           31.    The structure claim 30 wherein the flush metal conductive circuitry is  
2   covered with gold or nickel-gold, and  
3                wherein gold wire bond attach exists between gold covered circuitry and said  
4   integrated circuit chip.

1           32.    A method of fabricating a structure having embedded substantially flush/coplanar  
2   circuitry features which comprises:  
3                providing carrier foil having a top side and bottom side and an electrically  
4   conductive blanket layer on said top side;  
5                coating the electrically conductive layer with a dielectric material;

6 forming circuitry features in said dielectric material; and  
7 plating conductive metal to fill said circuitry features.

1 33. The method of claim 32 which further comprises planarizing the side of the  
2 structure containing said conductive metal to provide a planar surface having features of  
3 conductive metal surrounded by dielectric material.

1 34. The method of claim 33, which further comprises the step of plating a  
2 conductive finish metal layer onto said planar surface.

1 35. The method of claim 35 which further comprises blanket seeding the top  
2 surface and circuit features in the dielectric material prior to plating the conductive metal.

1 36. The method of claim 35 wherein the conductive metal is blanket plated in  
2 the seed layer followed by planarizing the conductive metal to provide a planar surface  
3 having features of conductive metal surrounded by dielectric material.

1 37. The method of claim 32 wherein the circuitry features are formed through  
2 the dielectric layer and up to the conductive layer exposes said layer.

1 38. The method of claim 32 wherein the circuitry features are formed in the  
2 dielectric layer and short of the conductive layer.

1 39. The method of claim 33 wherein plating conductive metal is plated only in  
2 the circuitry features.

1 40. The method of claim 8 which further comprises attaching the structure after  
2 the planarizing to a substrate or dielectric.

1 41. The method of claim 39 which further comprises removing the carrier foil  
2 while the conductive layer protects the conductive metal from being removed, and then  
3 removing the conductive layer.





3 and which further comprises plating a conductive material selectively onto  
4 the underlying conductive layer;  
5 attaching the structure to a stiffener; and  
6 removing the carrier foil while the conductive layer protects the conductive  
7 metal from being removed and then removing the conductive layer to form a smooth surface  
8 wiring on one side and a rough surface on another side.

1 54. The structure obtained by the process of claim 32.